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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,786	02/18/2004	Takako Yamaguchi	03500.018031	9842
5514	7590	08/08/2006	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			RUGGLES, JOHN S	
			ART UNIT	PAPER NUMBER
			1756	
DATE MAILED: 08/08/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/779,786

Applicant(s)

YAMAGUCHI ET AL.

Examiner

John Ruggles

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 20 is/are rejected.
- 7) ☒ Claim(s) 4-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/11/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicants' election with traverse of Group I (claims 1-18 and 20) in the reply filed on 6/30/06 is acknowledged. The traversal is on the ground(s) that any search of Group I would necessarily also require a search of Group II (claim 19) with only nominal additional burden on the Examiner.

However, this is not found persuasive for at least the following reasons. (1) Contrary to Applicants' assertion, the search required for instant claims 1-18 and 20 (Group I) in class 430, subclass 5 and class 355, subclass 78 does **not** include that for instant claim 19 (Group II) in class 430, subclass 311 (as previously pointed out). (2) The inventions of Groups I and II are distinct from each other in accordance with MPEP § 806.05(e) for the reasons previously set forth. (3) These distinct inventions have acquired a separate status in the art as shown by their different classification as well as their recognized divergent subject matter (both of which were previously indicated and neither of which has been specifically disputed by Applicants). (4) Also, examination of these distinct inventions together would place serious additional burden on the USPTO Examiner for conducting the diverse additional search(es) that would be required for each of these distinct inventions (MPEP § 808.02). Applicants are mistaken if they believe that advocacy of serious additional burden for the USPTO Examiner would somehow lessen burden on the USPTO as a whole.

Furthermore, MPEP § 803 states, in part, "a serious burden on the examiner may be *prima facie* shown if the examiner shows by appropriate explanation of separate classification, or separate status in the art, or a different field of search as defined in MPEP § 808.02". The

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distinct inventions of Groups I and II have been previously shown to be separately classified, so Applicants' request to withdraw the previous restriction requirement would place a serious additional burden on the Examiner. Therefore, the restriction requirement is still deemed proper and is now made FINAL.

Claim 19 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention.

### ***Drawings***

Figures 10 and 11A-11B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (as indicated in the brief description of conventional near-field mask Figures 11A-11B at page 12 lines 7-8 and the corresponding stress versus position across the membrane of a conventional near-field mask in Figure 10 as described at page 4 lines 13-27). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms, which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification

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are: (1) at page 2 lines 11-12, the meaning of carrying out “fine processing uncursally” with one or more SNOM processing probe(s) is unclear; (2) at page 2 lines 22-23, “transferring the minute pattern of the photomask onto the photoresist at once” should also be clarified (to e.g., --transferring the whole minute pattern of the photomask onto the photoresist at [[once]] the same time--, etc.); and (3) at page 3 line 2, “several tens nm” should be corrected to --several tens of nm--. Note that due to the number of errors, those listed here are merely examples of the corrections needed and do not represent an exhaustive list thereof.

Appropriate correction is required. An amendment filed making all appropriate corrections must be accompanied by a statement that the amendment contains no new matter and also by a brief description specifically pointing out which portion of the original specification provides support for each of these corrections.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-18 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 and throughout claims 2-18 and 20, intended use statements, such as “for near-field exposure” (claims 1-18, line 1) and “for relieving stress” (claim 20, last paragraph at page 37 lines 2-3), are not particularly limiting. However, for the purpose of this Office action and in order to advance the prosecution of this application, these statements have been interpreted to the extent that they are enabled by the specification. Nevertheless, Applicants should still clarify the

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meaning of these intended use statements as positively recited limitations that are in accordance with the original specification (e.g., “A photomask for near-field exposure” should be changed to --A near-field exposure photomask ~~for near-field exposure~~--, etc.). Instant claims 2-18 depend on claim 1.

In claim 3, “**thick part in a region of** the membrane portion” (emphasis added) is unclear about (1) the meaning of “**thick part**” since no specific dimension or even a relative value for the thickness of this part is given and (2) the meaning of “**in a region of**” for the location of the thick part is also uncertain. However, for the purpose of this Office action, claim 3 has been interpreted reasonably broadly to mean (1) that the “**thick part**” is relatively thicker than some other part of the mask (e.g., thicker than the mask substrate, etc.) and (2) that this thick part is located near a border between the mask substrate or support portion and the patterned mask membrane portion. Instant claim 4 depends on instant claim 3.

In claim 5, “the thickness of the shielding membrane **around** the membrane portion is larger than that in the center portion of the membrane portion” (emphasis added) is unclear with regard to which particular part of the shielding membrane has a larger thickness than that at the center thereof.

Similarly in claim 7, “another layer provided on the shielding membrane **around** the membrane portion” (emphasis added) is unclear with regard to which particular part of the shielding membrane has been provided with another layer.

It is unclear if the larger thickness in claim 5 and the additional layer in claim 7 are located at: (3) the peripheral portion on the supporting substrate, (4) the peripheral portion adjacent to but not overlapping the supporting substrate, (5) both (3) and (4), or (6) either (3) or

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(4). However, for the purpose of this Office action, claims 5 and 7 have each been interpreted in accordance with (5) above, based on the description of the instant embodiment 4 near-field photomask at page 20 line 20 to page 21 line 5 (as shown in Figure 4A).

In claim 8, “stretches **toward** the membrane portion side” (emphasis added) is unclear with regard to the location of the intermediate layer formed between the substrate and the membrane portion. However, for the purpose of this Office action, claim 8 has been interpreted in view of the instant embodiment 3 near-field photomask shown in Figure 3D (as described at page 20 lines 8-19).

In claim 12, “wherein the structure is a deformable concave portion **or** a hole structure that is formed in a region **around** the membrane portion **and/or** in the substrate” (emphasis added) is unclear with regard to the particular location where either the deformable concave portion or the alternative hole structure is formed. However, for the purpose of this Office action, this language is construed to include the embodiments shown by instant Figures 1A, 6A-6B, 7A-7B, 8A-8C, and/or 9A-9B.

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (JP-61065250 A).

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Nakamura et al. teach a contact glass mask (title) for contact patterning of a wafer to make a semiconductor device. Figure 1 shows a glass mask 1 having a body 11 pushed into contact with a wafer 3 without deforming the mask body, because the mask is held to a mask support base 2 by a thick support member 12 (which serves as a flexible membrane) that easily deforms elastically and is made of rubber, polyurethane rubber, etc. or resin (abstract). The mask is understood to operate in the near field region when in contact with the wafer and the mask is also understood to have a transparent substrate with a light shielding pattern or membrane having a micro-aperture on the substrate that would be needed in order to pattern the wafer (or a resist layer on the wafer) during exposure printing. The elastically deformable support member or membrane serves to disperse, decrease, or relieve stress that would otherwise occur in the mask (e.g., at the border between the mask body and the support base, etc.) when the mask is pushed into contact with the wafer (instant claims 1-3).

Claims 1-3 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyake (US 4,888,488).

Miyake teaches an exposing apparatus used in fabrication of printed integrated circuits (title). Front page Figure 1 shows an exposing apparatus with a peripheral seal 20 in a space between an original (e.g., patterned mask, etc.) 1 and a material to be exposed (e.g., resist coated wafer, etc.) 7 by a packing of hollow elastic material (e.g., rubber, etc.) 20, in order to evacuate the space below the original patterned mask and thereby ensure slight clearance or intimate contact between the original patterned mask 1 and the material or resist to be exposed 7, the packing 20 is hollow so as to make it possible to change its thickness by changing its internal pressure before exposure with a light source for ultraviolet (UV) rays 17 (abstract, c3/L36-



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c6/L13). The mask is understood to operate in the near field region when either in contact or in slight clearance with the wafer and the mask is also understood to have a transparent substrate with a light shielding pattern or membrane having a micro-aperture on the substrate that would be needed in order to pattern the wafer (or a resist layer on the wafer) during exposure printing. The hollow elastic material seal (e.g., rubber, etc.) serves to disperse, decrease, or relieve stress that would otherwise occur in the mask (e.g., at the border between the mask body and the support base, etc.) when the mask is pushed into contact with the wafer (instant claims 1-3 and 20).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inao et al. (EP-1150162 A2) in view of either Nakamura et al. (JP-61065250 A) or Miyake (US 4,888,488).

Inao et al. teach a near field exposure mask, method, and apparatus (title, abstract). In one embodiment shown by Figures 7A-7C, the near field mask (701) includes a metal thin film shading member (703) having a micro-aperture pattern (704), showing apertures of two different widths (paragraphs [0070-0072]). In the apparatus for exposure of a photoresist through the near field mask 501 held by the container or stage 505 using a light source 509, the photoresist layer 507 is formed on the surface of a substrate 506, which is held on a movable stage or sample table 508, as shown in Figure 5 ([0044-0046]). The sample table 508 is driven in the direction normal

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(perpendicular) to the mask 501 to control the distance between the photoresist 507 on the (work) substrate 506 and the mask 501 in order to achieve a gap less than 100 nm where near field light exists for exposure from a light source providing a wavelength in the range of 325 nm to 450 nm ([0035, 0045, 0047, 0048], which suggests a need for close tolerance in distance when using near field light emanating through micro-apertures (e.g., smaller than 100 nm, etc.) in a near field mask [0004]).

Inao et al. do not specifically teach the use of a stress relieving structure between the patterned mask portion and the mask substrate or support.

The teachings of Nakamura et al. and Miyake are discussed above.

It would have been obvious to one of ordinary skill in the art at the time of the invention in the near field exposure mask and the near field exposure apparatus taught by Inao et al. to have included a structure that serves to disperse, decrease, or relieve stress with the mask (as taught by either Nakamura et al. or Miyake), because such a structure would reasonably be expected to allow relative movement of the mask pattern (e.g., when drawn closer to an object such as resist on a wafer to be exposed, etc.) with reduced risk of damage to the mask or the object to be exposed.

#### ***Allowable Subject Matter***

Claims 4-18 are objected to as being dependent upon a rejected base claim, but would be allowable if (1) rewritten to overcome all applicable rejections under the second paragraph of 35 USC 112 as set forth above and (2) rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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As allowable subject matter has been indicated, Applicants' reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

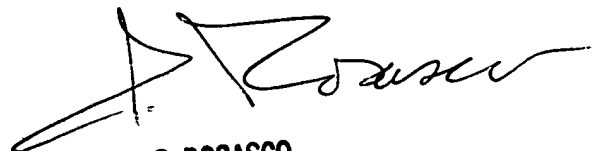
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 571-272-1390. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jsr



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